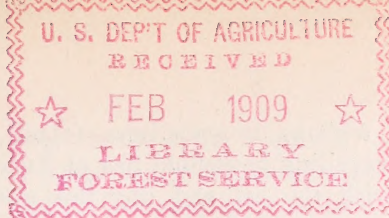


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CIRCULAR NO. 108.

Issued February 11, 1909.

United States Department of Agriculture, BUREAU OF ENTOMOLOGY.

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HOUSE FLEAS.

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Judging from the specimens of fleas sent to the Bureau of Entomology of recent years with complaints of houses being infested by them, the human flea (*Pulex irritans* L.) is not the species most likely

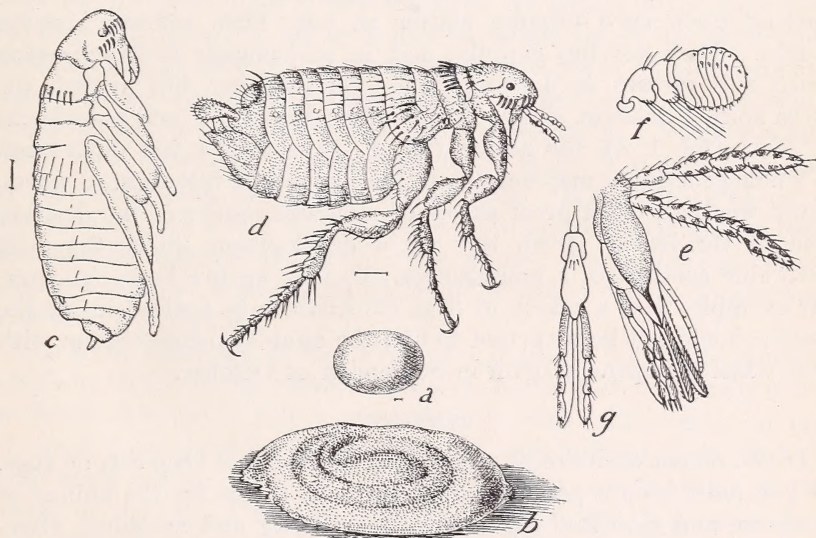


FIG. 1.—Cat and dog flea (*Ctenocephalus canis*): a, Egg; b, larva in cocoon; c, pupa; d, adult; e, mouth-parts of same from side; f, antenna; g, labium from below. b, c, d, Much enlarged; a, e, f, g, more enlarged. (Author's illustration, redrawn.)

to occur in great numbers in dwelling houses in this country, but rather the common, cosmopolitan flea of the dog and cat (*Ctenocephalus canis* Curtis).^a This holds especially for the eastern

^a In the earlier publications of this office, Bulletin 4 and Circular 13, this species has been referred to under the name *Pulex serraticeps* Gerv.

United States. *Pulex irritans* is sometimes found in houses in California, and is the prevailing household flea of Europe. A house may become infested with the cat and dog flea even though no domestic animals be kept, for a visitor at a house where such pets are maintained may be the means of carrying home with him one or two female fleas which will stock his own premises. Of course, where a pet dog or cat is kept, the source of the infestation is manifest.

The worst cases of infestation reported to this Bureau have usually been those in which houses had been temporarily unoccupied during the summer. Such houses during a rainy summer become more or less damp, and as a rule the customary sweeping of the floors is interrupted, thus furnishing the very conditions under which, as we shall see, fleas most readily propagate.

The eggs (fig. 1, *a*) of *Otenocephalus canis* are deposited among the hairs of cats and dogs, but as they are not attached to the hairs, numbers drop off whenever the infested animal moves or lies down. From these eggs hatch the larvæ (fig. 2, *a*), which are slender, minute, white, wormlike creatures. They are very active, crawl rapidly, penetrate into the cracks of the floor, and live there until full grown, feeding upon such organic matter as may have collected in the cracks. They develop rapidly, and in midsummer in Washington reach full growth in a short time. On reaching full growth the larva spins a delicate, white, silken cocoon (fig. 1, *b*), and transforms to pupa (fig. 1, *c*), the adults (fig. 1, *d*) issuing a few days later. A whole generation may develop in the course of a fortnight in warm, damp weather, but a great excess of moisture results in the destruction of the larvæ. With this rapid development under the most favorable conditions, a housekeeper, shutting up her house in June, for example, with a colony of fleas too small to be noticed inside the house, should not be surprised to find the establishment overrun with fleas when she opens it again in September or October.

REMEDIES.

If you do not desire to be troubled by fleas, do not keep cats or dogs. If you must keep a pet dog or cat, provide a rug for the animal to sleep on, and give this rug a frequent shaking and brushing, afterwards sweeping up and burning the dust thus removed. As all the flea eggs on an infested animal will not, however, drop off in this way, and as those which remain on it will probably develop successfully, it will be found wise to occasionally rub into the hair of the dog or cat a quantity of pyrethrum powder. If thoroughly applied, this powder will cause the fleas to fall off in a half stupefied condition, when they, too, may be swept up and burned.

The larvæ of the dog and cat flea will not develop successfully in situations where they are likely to be disturbed. The use of carpets

and straw mattings, in the writer's opinion, favors their development, since the young larvæ can penetrate the interstices of either sort of floor-covering and find an abiding place in some crack where they are not likely to be disturbed. It is comparatively easy to destroy the insect in its early stages (when it is noticed), but the adult fleas are so active and so hardy that they successfully resist any but the most strenuous measures. Even the persistent use of California buhach and other pyrethrum powders was ineffectual in one case of extreme infestation, as was also, and more remarkably, a free sprinkling of floor mattings with benzine. In this instance it was finally necessary to take up the floor-coverings and wash the floors down with hot soapsuds in order to secure relief from the flea plague. In another case, however, a single liberal application of buhach was perfectly successful, while in a third a single thorough application of benzine completely rid an infested house of fleas.

In bad cases almost nothing will avail without the greatest care in keeping the floor and other coverings, as well as crevices, etc., free from dust and dirt. The old remedy often mentioned of putting a piece of raw meat upon a sheet of sticky fly paper, in the hope that the fleas will jump for the meat and be caught by the fly paper, has been thoroughly tried by the writer without success. Where there are comparatively few fleas in a house or in a given room, the following somewhat laborious plan will result in eradication. Place a white cloth, like a pillowcase, in the middle of the floor. The fleas, attracted by the white color, will jump on the cloth. Then, with a basin of water, kneel down and with the wetted forefinger pick up the fleas one after another and put them in the water. The writer has known several houses in Washington to be rid of rather sparse populations of fleas in this manner.

Mr. E. M. Ehrhorn, of San Francisco, gives the following remedy, which he states he has tested and which his mother used with effect in South America. Fill a glass three-fourths with water, on top of which pour about an inch of olive oil, then place a night float (a little wick inserted in a cardboard disk or in a cork disk) in the center of the oil. Place the tumbler in the center of a soup plate filled with strong soapsuds. The wick should be lighted at night on retiring, or may be used in any dark room. As the soup-plate-soapsuds trap is placed on the floor of the room it does not interfere with the sleeper, and the fleas which are on the floor are attracted to the light. For outbuildings, such as barns, etc., a large milk pan may be used, and instead of using olive oil and a glass, a stable lantern may be placed in the center of the pan, while instead of soapsuds a scum of kerosene may be put on the water in the milk pan.

To sum up: Every house where a pet dog or cat is kept may become seriously infested with fleas if the proper conditions of moisture and freedom from disturbance exist. Infestation, however, is not likely to occur if the (bare) floors can be frequently and thoroughly swept. When an outbreak of fleas comes, however, the easiest remedy

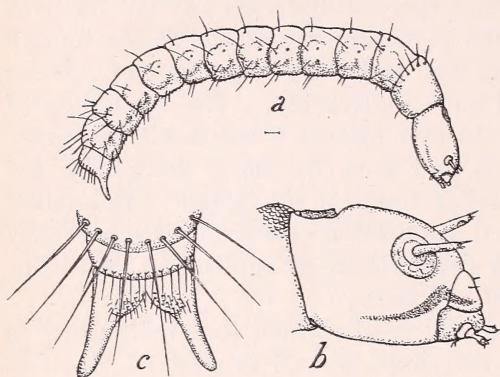


FIG. 2.—Cat and dog flea (*Ctenocephalus canis*): *a*, Larva; *b*, head of same; *c*, anal end of same. *a*, Much enlarged; *b*, *c*, more enlarged. (Author's illustration, redrawn.)

to apply is a free sprinkling of pyrethrum powder in the infested rooms. This failing, benzine may be tried, a thorough spraying of carpets and floors being undertaken, with the exercise of due precaution in seeing that no lights or fires are in the house at the time of the application, or for some hours afterwards. Finally, if the plague is not thus abated, all floor coverings must be removed

and the floors washed with hot soapsuds. This is a useful precaution in any house which it is proposed to close for the summer, since even a thorough sweeping may leave behind some few flea eggs from which an all-pervading swarm may develop before the house is reopened.

Approved:

JAMES WILSON,

Secretary of Agriculture.

WASHINGTON, D. C., December 29, 1908.

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